

# JOAP News & Views

3<sup>rd</sup> Quarter 1999

## FT-IR Correlation Program

The JOAP-TSC initiated an FT-IR Correlation Program on June 1st. The FT-IR Correlation Program will provide information similar to the atomic emission/absorption (AES) correlation program. It will assist management and individual laboratories in evaluating instrument and operator performance and provide confidence in correlation among laboratories for transient work.

Two to three samples will be sent every two months. The program is being evaluated for the first three sets (or 6 months.) At this time, there is no certification associated with the FT-IR correlation.

Results from the first set of samples have already indicated some instrument problems, e.g., water vapor issues due to expired desiccant or incorrect collection parameters.

Individual laboratories will be notified of any problems identified with a copy to the appropriate Program Office.

The Army Program Office selected stateside Army laboratories for Army participation in the program. Several Air Force laboratories with FT-IR instruments are also participating. If you are interested in participating in the program or would like more information, please contact any of the individuals mentioned below.

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### What's inside:

The Standards Corner  
Bottle Survey  
and more ...

If you have a topic you would like discussed or wish to submit an article, please contact the newsletter editor.

### NEWSLETTER EDITOR

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## The JOAP AES Correlation Program *Techniques and Effectiveness*

The Correlation Program accomplishes many things for JOAP laboratories, management, and the JOAP-TSC.

1. It is used to help evaluate both operator and spectrometer performance.
2. It indicates the need for operator training due to poor operator performance.
3. Repair actions are initiated for poor spectrometer performance.
4. US service laboratories and many government contract laboratories are certified through participation in the Correlation Program.

The workings and procedures of the program must be fully understood to get the most benefit. Each month, every enrolled laboratory receives a set of four samples for all assigned spectrometers. Samples 1 and 2 are petroleum oil samples similar to the JOAP standards. Samples 3 and 4 are polyol ester oil samples, usually MIL-L-23699 oil, a common lubricant for jet engines. The JOAP Correlation Program ensures that your instrument is providing repeatable results for polyol ester fluids, and also a wide variety of metal concentrations of petroleum oil. Please keep in mind that the final statistical analysis is based on what the majority of laboratories submit for that particular month for each element. In other words, every month, the concentrations and pass/fail criteria are unique for all of the fifteen JOAP elements. The allowable pass/fail tolerance can vary from month to month, even for the same element at the same concentration. If lab results are varying widely, then the criteria for passing will increase. Conversely, if lab results are very consistent, then the criteria for passing will decrease.

Here are some things to look for each month:

1. Was the monthly score 80 percent or above? This will ensure at least an 80 average. If a score dips below 80, look for the cause. If you have previously scored high, even a score in the 80's may require investigation.
2. Is the three month average 80 percent or above? This is required to remain JOAP certified (if the laboratory/spectrometer is eligible for certification.)
3. Are the same elements failing often? From month to month, the same elements should not consistently fail especially critical elements.

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## Correlation Corner

by Mike Cassady

### The JOAP AES Correlation Program Techniques and Effectiveness

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4. Is scoring about the same each month? A wide swing of scoring may indicate procedural problems. If one operator obtains low scores, check that operator's techniques. The JOAP-TSC recommends that you rotate the operators that perform the correlation sample analysis. How can you effectively evaluate operator performance if only one highly trained operator performs the analysis each month?
5. Were the failures primarily R1 (Inter-Lab)? R1 failures indicate accuracy problems, high or low. Consistent R1 failures can mean that the internal working curves/electronics may require adjustment. Sporadic R1 failures may indicate operator error.
6. Were the failures primarily R2 (Intra-Lab)? R2 failures indicate repeatability problems—the numbers aren't consistent. R2 failures are normally spectrometer or electrode problems. However, an operator should know when to eliminate one burn that is inconsistent with other burn data.
7. Were the failures random, or did the same element fail for both 1&2 and 3&4? A failure of R1 for both sets usually indicates a standardization problem. R2 failures for both sets indicate a spectrometer problem for that particular element.
8. Have the same elements failed R1 and/or R2 for several months? Repeated failures should be reported to the manufacturer for resolution. Be sure to contact your Program Management Office first.

If you take a common sense approach to the performance of JOAP Correlation samples and effective evaluation of the results, your laboratory may never have to go through the process of recertifying a spectrometer.

## 2000 CONFERENCE

by Allison Toms

Do you have some interesting case histories or success stories? Please consider presenting the data at the Technology Showcase 2000. If you do not want to write a paper, the presentation can be informal, just using overheads. We will be happy to assist you any way we can. The primary request from the 1998 conference was more on case histories and successes! (See 3rd quarter 98 newsletter - conference in review.) Everyone can learn and benefit from your experience.

Conference flyers were mailed in June.

For further information on any conference topic contact:

conference@joaptsc.navy.mil

or Allison Toms at 850-452-3191x106

## Save Your Data!

by MSGT Paul Dorsey

The TSC has had a number of instances where we have tried to determine if a problem area is linked to an instrument, standard, electrode batch, operator procedure or a combination of one or more of these factors. In many cases this is difficult if not impossible to trace because the field laboratories involved are not providing this essential data on their monthly correlation result submissions. Essential information includes spectrometer type, batch numbers of standards used (D19-0, D12-100 and D3-100), and batch numbers for electrodes. The 'Comments' section should be used to report out of the ordinary occurrences such as suspected sample contamination ('floaters'), leakage, and the like.

When the monthly list of decertified spectrometers is compiled, the first thing we do is to compare the results of all of the affected laboratories to see if there is a common denominator such as spectrometer type, same batches of standards or electrodes. This information often provides an immediate clue to a problem if there is a common thread. If the labs don't provide this information, we then try to contact the labs to see if they can provide the information. In many cases, the information is unavailable because it was not recorded; this, in turn, means that if there is a problem, it will go undetected for a longer period because we have nothing to go on.

Although not required by regulation, there are several good reasons to make it a practice to maintain a copy of your daily standardization and correlation analysis computer printouts for one year:

1. You suspect that your instrument isn't operating properly. Data from earlier standardizations and analyses will show trends and help you to determine if something is happening. Your maintenance guys will thank you.
2. Your lab is getting poor correlation scores. It's a lot easier to troubleshoot the instrument or procedure if you have previous analysis information to compare. If you're consistently missing the same element month after month, it's a dead giveaway that something's wrong. Seek assistance through your Program Manager/Director.
3. Your correlation results didn't get to us. If you don't have your information from the original analyses, then you have to reanalyze the samples.

The recommended method for maintaining the information is to label a manila folder with each month for each assigned instrument. Purge the old results when the new month of each year rolls around.



## Trace Elements in JOAP Standards

There are three types of JOAP spectrometric standards – D19, D12, and D3. D19 standards contain 19 elements in specified concentrations; D12 standards contain 12 elements in specified concentrations and the D3 standard contains specified concentrations of 3 elements.

It is not unusual to see trace amounts of other elements in the D12 and D3 standards. The base oil from which the standards are blended can contain up to 2.5 PPM of Na and up to 1.5 PPM of the other 18 elements which concern JOAP. So, you may see 1 PPM of Fe in a D3-100 standard or 0.75 PPM of Mo in a D12 standard.

When possible, trace contaminants are accounted for in the blending procedure. For a particular type of standard, we can adjust for trace contamination of elements that are present in the standard. For instance, in a D12 standard, there is no way to make up for trace amounts of molybdenum, cadmium or zinc, so you may see small amounts; but we can account for trace amounts of Fe or Ni. Seeing trace contamination should not be a cause for concern.

## Questions?

Once in a while, customers experience unusual situations and have questions about JOAP standards. The JOAP-TSC is the place to come. Quite often, we can solve the dilemma right then, over the phone. Sometimes, it may take a day or two of testing different scenarios. Occasionally, solving a problem for the customer may take several days of intensive testing. Whatever we need to do in order to help a customer, there is always one common thread. We always need your data for review. We need to be able to see how an instrument is behaving and responding under normal operating procedures. We need to see standardization information, analysis of the check standards and analysis of the standard in question. In order for you to provide this information, you need to print this information during the normal course of operation.

We realize that it is not a requirement to keep a record of all of this data, but having this information gives you and the JOAP-TSC a big advantage when trying to troubleshoot a problem. Print out all of this information as you are doing your standardization or daily check samples. If you encounter unusual happenings, then this information is immediately available to you and us. If everything goes well, then you can dispose of whatever information you don't need. Printing your data doesn't require extra effort, uses very little paper and will save a lot of time if questions arise.

## MSDS for JOAP Standards

The JOAP-TSC will no longer supply a material safety data sheet (MSDS) in each canister of JOAP standard. The practice of supplying an MSDS in each canister was discontinued in June 99. A hard copy of the updated MSDS for the JOAP standards was mailed to each JOAP correlation customer along with April 99 correlation results. Keep the hard copy for future reference. If your lab should need a copy of the MSDS in the future, there are several ways to obtain it. The MSDS is located on the JOAP-TSC website <http://www.joapts navy.mil>; we can e-mail the MSDS to you as an attachment; the JOAP-TSC can fax the MSDS if you don't have web access; and we can also mail the MSDS.

## Shelf-Life

The following is the definition for product shelf-life: the amount of time from date of manufacture that an item can remain on the shelf in the packaged state, until deterioration occurs, causing the item to be disposed of or tested for reuse.

Except for D19-0 oil, each of your JOAP spectrometric standards has a definite shelf-life. Your laboratory should consume the standard well before its expiration date. Chemical changes begin to occur around the end of the shelf-life, so to use a standard that has 1-2 weeks time left before expiration is taking a risk. It is extremely difficult to predict exactly when chemical changes start to occur, so you should consume a standard well before its expiration date. If you find that your lab is disposing of expired standards on a regular basis, then maybe you should rethink your ordering procedure.

## Expiration Date

Starting June 1999, standards will show an expiration date of Month and Year only. Example: April 2000. Standards should not be used in the month shown e.g., do not use beyond March 31, 2000 for a standard that expires in April 2000.

## Beyond Use

As of 30 June 1999, the following standards have expired and should be discarded:

Concentration	Batch Number
D12-5	MB12-5-61 and below
D12-10	MB12-10-140 and below
D12-30	MB12-30-103 and below
D12-50	MB12-50-79 and below
D12-100	MB12-50-248 and below
D12-300	MB12-300-34 and below
D3-100	MB3-100-151 and below

Note: Remember, do not wait until the expiration date to use your standard. Use all of the standard several months before the expiration date.



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## ***JOAP-TSC BOTTLE SURVEY***

**by Vee Bersabal**

Our survey about bottles has ended. This survey was intended for cost comparison purposes and to determine the preferences of the different laboratories that we service. As of June 10, 1999, 121 laboratories have responded to our survey on bottles with tips (current) v/s bottles without tips (flat caps.) There was no contest. The breakdown is as follows:

### **Bottles with tips (current):**

<b>Yes</b>	<b>111</b>
Ease of pouring	13
No contamination	4
Not messy	8
All of the above	25
No added comments	61

### **Bottles without tips (flat caps):**

<b>Yes</b>	<b>10</b>
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We want to thank everyone that responded to our survey. We appreciate your cooperation and input.

## **Meetings & Conferences**

48th Defense Working Group on Nondestructive Testing, 1 - 4, Nov 99, Indian Head, MD. Contact: BurtchetteDE@ih.navy.mil  
Predictive Preventive Maintenance, 15-18 Nov 99, Atlanta, GA. Contact: scpub@sierra.net, Ron James (800) 848-8324  
Technology Showcase 2000, JOAP International Condition Monitoring Conference, 3 - 6 Apr 2000, Mobile, AL  
Contact: conference@joaptsc.navy.mil, Allison Toms (850) 452-3191x106